Econ 590: INFORMATION TECHNOLOGY: COMPUTER SYSTEMS AND NETWORKING

This course covers the fundamentals of computer systems, networking and Internet tools.

1. Introduction
   - Course outline, motivation and objectives
   - Computer science and engineering during the last 40 years
   - Brief overview of IT, use cases and the needs of modern work forces
   - Tracking technology evolution and evaluating options

2. Fundamentals of Computer Systems
   - Overview of computer architectures and organization
   - CPUs, Memory, System interconnects
   - Peripherals and I/O architectures
   - The software layers: Operating systems, interpreters & compilers, libraries
   - Concepts of distributed and parallel computing
   - Scalability, load-balancing, and interoperability issues

3. Fundamentals of Networking
   - Introduction to the Ethernet, LANs, WANs, and Wireless Networks
   - Introduction to the Internet
   - Routing and transport fundamentals (TCP/IP, UDP, RTP)
   - Security solutions (Firewalls, Spam and URL Filters)
   - Access networks alternatives (DSL, 2.5G/3G Wireless, WiFi, etc)
   - Convergence and the triple-play challenge (Data, Video, Audio)
   - Monitoring the health and protecting your network infrastructure

4. Fundamentals of Programming and Internet Tools
   - Introduction to programming language concepts
   - Java as an Internet programming platform
   - Basics on data structures and object libraries
   - Software interoperability and APIs (Sockets, POSIX, Linux)
   - Open Source software tools

5. Conclusion and Summary